



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/762,223

01/20/2004

J Gary Eden

10322/41

2183

757 7590 04/13/2010
BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, IL 60610

EXAMINER

SHAHRESTANI, NASIR

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

04/13/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/762,223	Applicant(s) EDEN ET AL.	
	Examiner NASIR SHAHRESTANI	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-64 is/are pending in the application.
- 4a) Of the above claim(s) 1-10, 12, 23, 29-33, 46 and 61 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11, 13-22, 24-28, 34-45, 47-60 and 62-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 3737

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 11, 13-22, 24-28, 34-45, 47-60 and 62-64 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11, 13, 14-21, 25-28, 34-45, 47-49, 52, 53, 59-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai (U.S. 7,075,055 B2) in view of Kingsley et al. (U.S. 6,871,084 B1).

Nagai teaches a measuring device comprising a first magneto-optical medium (structure 48) that exhibits a response in the form of faraday rotation (col. 17 lines 34-39) by the application of a magnetic field and exhibition of hysteresis characteristics; a light source (element 2201) to emit light that impinges on the magneto-optical element; a modulation element (modulator, structure 49) to apply a time-varying magnetic field of sufficient strength; a detector (claim 1) configured to detect a change in the light caused by a reaction of the first magneto-optical element to a magnetic field of a subject. Nagai further teaches providing a permalloy film (col. 29 lines 42-67) and means to order remove background noise to observe clear magnetized distribution. Nagai further teaches providing a shielding film (element 2106) which provides general shielding of all components from electromagnetic radiation. Nagai teaches a pattern generator (element 706) which inputs a trigger signal (element 707) synchronized with the pattern signal to a delay circuit (element 705). The laser driver (element 712) generates a drive pulse (element 713) by the inputted trigger (element 711) to drive a semiconductor laser (element 714) with a pulse (see fig. 7). Nagai further teaches a platform (sample stage 2205) for the system which can be construed to provided some degree of vibration isolation. Nagai further teaches a liquid crystal spatial phase modulator (element 1501).

Nagai does not teach the modulation element comprising a coil adjacent to the first magneto-optical element, the modulation element being a source of time varying magnetic field.

Kingsley et al. teach a high impedance optical electrode comprising an optical fiber (element 28), wrapped like a coil thereby producing a phase modulation in light (element 22) that resides inside the optical fiber (col. 19 lines 38-44).

Art Unit: 3737

It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Nagai and to have integrated the teachings of Kingsley et al. in order to provide a coiled optical modulation element that would assist in reducing noise.

Regarding claims 15 and 44 Nagai clearly teaches the use of thin films in various configurations (fig. 20A, 20B, 20C) which are utilized as magneto-optical elements within the system. Nagai does not teach the use of two magneto-optical within the system.

It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Nagai and to have provided another magneto-optical film element, since the mere duplication of parts has not patentable significance unless a new and unexpected result is produced.

Furthermore, Nagai does not specifically teach the use of a single nonmagnetic frame upon which optical components of the detection apparatus are mounted however such a modification would only require routine skill in the art and hence it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Nagai and to have provided a nonmagnetic frame for mounting in order minimize interference due to magnetic fields of the system.

Claims 22, 24, 50, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai (U.S. 7,075,055 B2) and Kingsley et al. (U.S. 6,871,084 B1) as applied to claim 11 above, and further in view of Matsushita et al. (U.S. 2002/0149832 A1).

Art Unit: 3737

Nagai teaches the optically active element (element 301) can be made of optically active crystals such as quartz (Figs. 3A and 3B). Nagai in view of Kingsley et al. do not teach YIG films.

Matsushita et al. teach a faraday rotator (see title) wherein a multilayer film type is provided in which satisfactory optical characteristics are obtained with a small number of layers (abstract). Matsushita et al. further teach the availability of YIG bulk single crystal, about 2mm in thickness (par. 0006).

It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Nagai in view of Kingsley et al. and to have provided another type of magneto-optical film element, such as YIG as taught by Matsushita et al. in order provide for an optimized film element.

Claims 54-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai (U.S. 7,075,055 B2) and Kingsley et al. (U.S. 6,871,084 B1) as applied to claim 40 above, and further in view of Tsukada et al. (U.S. 2002/0173714 A1).

Nagai in view of Kingsley et al. teach all the limitations of claim 40 but do not teach the measurement of magnetic fields from the heart.

Tsukada et al. teach a system wherein magnetic fields of the heart are measured (Figs. 25A, 25B, and 25C).

It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Nagai in view of Kingsley et al. and to have included the known means of measuring the magnetic field of the heart in order to provide mappings for diagnostic purposes.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NASIR SHAHRESTANI whose telephone number is (571)270-1031. The examiner can normally be reached on Mon.-Thurs: 7:30-5:00, 2nd Friday: 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3737

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN CASLER/
Supervisory Patent Examiner, Art Unit
3737

/Nasir Shahrestani/
Examiner, Art Unit 3737